

What is claimed is

1. A flexible mold for producing a PDP back surface plate including a rib region having ribs having a predetermined shape and a predetermined size and a non-rib region occupying at least a part of a peripheral portion of said rib region, comprising:
 - 5 a support and a molding layer disposed on said support; wherein said molding layer is equipped on a surface thereof with groove patterns necessary for duplicating ribs having a predetermined shape and a predetermined size in a rib formation portion corresponding to said rib region of said back surface plate; and in a rib non-formation portion corresponding to a non-rib region of said back surface plate, said molding layer is formed to a thickness necessary for forming a thin film made of the same material as that of said ribs in said rib non-formation region.
- 10 2. A flexible mold as defined in claim 1, wherein said support and said molding layer are transparent.
- 15 3. A flexible mold as defined in claim 1 or 2, wherein said molding layer is equipped in said rib region with a portion necessary for forming a thin film made of the same material as that of said ribs between adjacent ribs.
- 20 4. A flexible mold as defined in any one of claims 1 to 3, wherein inclination is applied to a terminal portion of each of said groove patterns in said molding layer.
- 25 5. A flexible mold as defined in any one of claims 1 to 4, wherein corners are removed from an upper end portion of a sidewall of said groove pattern.
6. A flexible mold as defined in any one of claims 1 to 5, wherein said molding layer further includes alignment marks applied to said rib non-formation portion.
- 30 7. A flexible mold as defined in any one of claims 1 to 6, wherein the support is made of at least one kind of plastic materials selected from the group consisting of polyethylene terephthalate, polyethylene naphthalate, stretched polypropylene, polycarbonate and

triacetate.

8. A flexible mold as defined in any one of claims 1 to 7, wherein the support has a thickness of 0.05 to 0.5 mm.

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9. A flexible mold as defined in any one of claims 1 to 8, wherein the molding layer consists of a cured product of a curable material.

10. A flexible mold as defined in claim 9, wherein the curable material is selected from the group comprising a photo-curable monomer, a photo-curable oligomer, and mixtures thereof.

11. A flexible mold as defined in claim 9, wherein the curable material is selected from acrylate and methacrylate.

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12. A flexible mold as defined in claim 11, wherein the curable material is selected from the group consisting of urethane acrylate, polyester acrylate and polyether acrylate.

13. A flexible mold as defined in any one of claims 1 to 12, wherein the groove pattern is a straight pattern consisting of a plurality of groove portions arranged substantially in parallel with one another with predetermined spacing among them in the rib formation portion of the molding layer.

14. A flexible mold as defined in any one of claims 1 to 12, wherein the groove pattern is a grid pattern consisting of a plurality of groove portions arranged substantially in parallel with one another with predetermined spacing among them while crossing one another in the rib formation portion of the molding layer.

15. A flexible mold as defined in any one of claims 1 to 14, wherein the thickness of the rib non-formation portion in the molding layer is smaller by at least 5 μm than the thickness of the rib formation portion from the surface.

16. A flexible mold as defined in claim 15, wherein the thickness of the rib non-formation portion is smaller than the thickness of the rib formation portion and within the range of 5 to 40 μm .

5 17. A flexible mold as defined in any one of claim 1 to 16, wherein an upper end portion of a sidewall of the groove pattern is chamfered.

10 18. A method of producing a flexible mold for producing a PDP back surface plate including a rib region having ribs having a predetermined shape and a predetermined size and a non-rib region occupying at least a part of a peripheral portion of said rib region, said method comprising the steps of:

15 preparing a mold duplicating a surface shape of said PDP back surface plate;

15 applying a photo-curable material at a predetermined thickness to a surface of said mold, thereby forming a photo-curable material layer;

15 further laminating a transparent support made of a plastic material on said photo-curable material layer of said mold, thereby forming a laminate body of said mold, said photo-curable material layer and said support;

20 irradiating light from the side of said support to said laminate body, thereby curing said photo-curable material layer;

25 forming a transparent molding layer equipped on a surface thereof with groove patterns necessary for duplicating ribs in a rib formation portion corresponding to said rib region of said back surface plate by curing of said photo-curable material layer, and formed, in a rib non-formation portion thereof corresponding to a non-rib region of said back surface plate, to a thickness necessary for forming a thin film made of the same material as that of said ribs in said rib non-formation region; and

25 releasing said molding layer with said support supporting said molding layer from said mold.

30 19. The method of claim 18, wherein the molding layer further includes a portion necessary for forming a thin film made of the same material as that of the ribs between adjacent ribs in the rib formation region.

20. A PDP back surface plate comprising a substrate having formed thereon a rib pattern layer having a rib region having ribs having a predetermined shape and a predetermined size and a non-rib region occupying at least a part of a peripheral portion of said rib region, wherein a thin film made of the same material as that of said ribs is formed to a predetermined thickness in said non-rib region.

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21. A PDP back surface plate as defined in claim 20, wherein said thin film in said non-rib region is formed of a curable molding material simultaneously with the formation of said ribs.

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22. A PDP back surface plate as defined in claim 20 or 21, wherein a thin film formed of the same material as that of said ribs is formed to a predetermined thickness between adjacent ones of said ribs in said rib region, and a thickness of said thin film is greater than, equal to, or smaller than, the thickness of said thin film in said non-rib region.

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23. A PDP back surface plate as defined in any one of claims 20 to 24, wherein inclination is imparted to a terminal portion of each of said ribs in said rib region.

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24. A PDP back surface plate as defined in any one of claims 20 to 23, wherein corners are removed from a root of each of said ribs in said rib region.

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25. A PDP back surface plate as defined in any one of claims 20 to 24, wherein alignment marks are applied to said non-rib region.

26. A PDP back surface plate as defined in any one of claims 20 to 24, wherein a straight pattern comprising a plurality of ribs so arranged as to be substantially parallel to one another with a predetermined spacing is provided in said rib region.

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27. A PDP back surface plate as defined in any one of claims 20 to 24, wherein a grid-like pattern comprising a plurality of ribs so arranged as to be substantially parallel to one another with a predetermined spacing while crossing one another is provided in said rib

region.

28. A PDP back surface plate as defined in any one of claims 20 to 27, wherein the thickness of the thin film is at least 5 μm in the non-rib region.

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29. A PDP back surface plate as defined in any one of claims 20 to 27, wherein the thickness of the thin film is within the range of 5 to 40 μm in the non-rib region.

10 30. A PDP back surface plate as defined in any one of claims 20 to 29, wherein a fillet is imparted to a root of the rib in the rib region.

15 31. A PDP back surface plate as defined in any one of claims 20 to 30, which further includes one set of address electrodes disposed substantially in parallel with, and independently of, each other with a predetermined spacing between them.

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32. A method of producing a flexible mold for producing a PDP back surface plate comprising a substrate having formed thereon a rib pattern layer including a rib region having ribs having a predetermined shape and a predetermined size and a non-rib region occupying at least a part of a peripheral portion of said rib region, said method comprising the steps of:

producing a flexible mold in accordance with said method as defined in claim 18;

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arranging a curable molding material between said substrate and a molding layer of said mold, thereby filling said molding material into groove patterns of a rib formation portion of said mold and applying it at a predetermined thickness to a rib non-formation portion;

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curing said molding material, thereby forming a PDP back surface plate comprising a substrate having formed thereon a rib pattern layer including a rib region having ribs having a predetermined shape and a predetermined size and a non-rib region occupying at least a part of a peripheral portion of said rib region, said back surface plate further including a thin film formed of the same material as that of said ribs to a predetermined thickness in said non-rib region; and

removing said back surface plate from said mold.

33. The method of claim 32, wherein the curable molding material is a photo-curable material.

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34. The method of claim 32 or 33, further comprising disposing one set of address electrodes substantially in parallel with, and independently of, each other with a predetermined spacing between them on the surface of the substrate.